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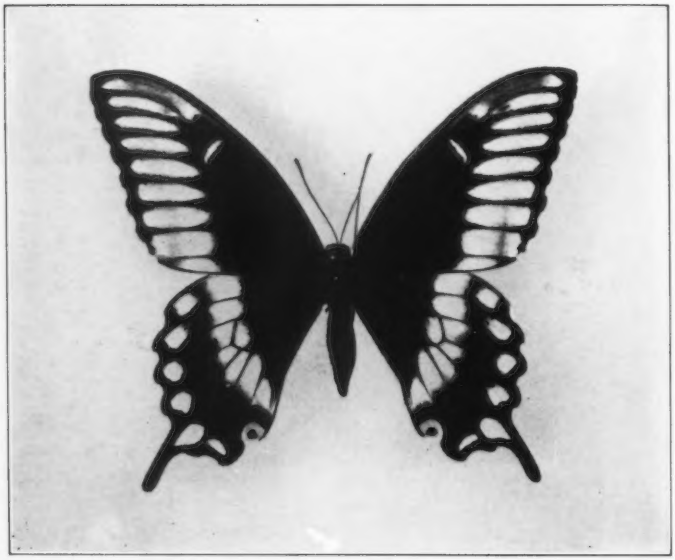

PAPILIO POLYXENES ABERR. FORSYTHAE—WOOD.

ENTOMOLOGICAL NEWS

VOL. XLVIII. DECEMBER, 1937 No. 10

A New Aberration of Papilio polyxenes Fabr. (Lepid.: Papilionidae.)

By WILLIAM C. WOOD, Mahopac, New York.

(Plate VI.)

PAPILIO POLYXENES **forsythae** new aberration.

About a year ago Mrs. L. E. Forsyth of Florida City, Florida, secured five male specimens of a striking aberration, which emerged with other members of the same brood, reared on dill. The four of these which I have seen are all very much alike and differ from the typical *P. polyxenes* as described below.

The markings and coloration of the secondaries above are as usual, but the primaries are strikingly different. The marginal row of spots of the primaries connects with the submarginal row, making a single row of transverse bands instead of the double row of spots. These bands are about ten centimeters in length and give a strikingly different appearance to the wing. In fact, the primaries are almost the exact counterpart of those of *P. calverlyii* Grote.

Beneath, the primaries repeat the pattern of the upper side. In three out of four specimens the secondaries below follow the normal pattern and coloration of the typical *polyxenes*, but one specimen has the usual blue of the space between the marginal and discal rows of spots replaced by a greenish yellow, sprinkled with fine red scales.

Type ♂, in my collection. Two *paratypes* ♂ ♂ including the form just described, also in my collection. One paratype ♂, in the American Museum of Natural History. The fifth specimen I have not seen, but Mrs. Forsyth tells me it is the same thing as my specimens. She had sent it to Mr. Arthur H. Forsman, of Los Angeles, California.

It gives me pleasure to dedicate this striking aberration to Mrs. Forsyth.

Where and When to find the Orthoptera of Pennsylvania, With Notes on the Species Which In Distribution Reach Nearest This State.

By Morgan Hebard, Philadelphia, Pennsylvania.

(Continued from page 225)

OEDIPODINAE.

Arphia sulphurea (Fabricius). Appearing adult in late April, this species is moderately numerous in dry undergrowth of open woodlands and waste fields throughout Pennsylvania.

A. xanthoptera (Fabricius). Supplants the former species in similar environment late in the Summer. Is probably generally more abundant. Appears adult early in August.

Chortophaga viridifasciata (DeGeer). Present throughout Pennsylvania. Common and generally distributed in colonies in open weedy and grass areas. Appears adult in mid-April and, persisting adult throughout the season, may prove to be partially double-brooded in parts of the State.

Encoptolophus sordidus sordidus (Burmeister). Present throughout Pennsylvania and often abundant in weedy areas in the open, except possibly in the Canadian Zone. Adults do not appear until mid-August.

Camnula pellucida (Scudder). Limited to the more boreal portions of the Canadian Zone in the mountains of Pennsylvania and with distribution there highly discontinuous. Appears in colonies in upland pastures of dry short grass. Becomes adult early in July. Yet known only from Tobyhanna, South Sterling, North Mountain, Shady Nook and Ebensburg in the Pennsylvania collections before me, but occurs south to Sounding Knob, Virginia at 4000 feet.

Hippiscus rugosus Scudder. Limited to the lowlands of Pennsylvania, northern limits in the East are Caldwell, New Jersey[2] and I have material from Perkasie, Rockville and Washington, Pennsylvania. Present in open woodland and upland pastures, small series only are known. Appears adult in early August.

Pardalophora apiculata (Harris). Probably present

[2] The records for Maine and Massachusetts are probably erroneous.

throughout Pennsylvania. Appears adult in late April. Local and not abundant, in colonies in the open preferring areas of poor soil.

DISSOSTEIRA CAROLINA (Linnaeus). Common and generally distributed in dry dusty places throughout Pennsylvania. Appears adult in late June or early July.

SPHARAGEMON PLANUM Morse. Present at moderate elevations throughout the mountains of Pennsylvania where it is very local, occurring on rock outcrops, gravelly areas, rocky hillsides and ridges. When located probably often numerous[3]. Sussex, New Jersey, is a northeastern limit. Appears adult in mid-July.

S. BOLLI BOLLI Scudder. Moderately common throughout Pennsylvania in woodland undergrowth particularly about oaks. Appears late in June.

As *Spharagemon collare* (Scudder) is known from Riverside and Woodbury across the Delaware in New Jersey it is almost certain to be found on sand or sandy waste land along that river in southeastern Pennsylvania, though not yet known from this State. It appears locally quite numerous early in July.

The same is true of the sand-loving *Scirtetica marmorata marmorata* (Harris), known from Bridgeboro and Woodbury Heights in adjacent New Jersey, except that this insect is probably scarcer and even more local.

PSINIDIA FENESTRALIS FENESTRALIS (Serville). A single specimen was secured in the vicinity of Philadelphia in 1908. The insect is probably present in sand areas along the Delaware River and possibly in low sandy spots throughout south-eastern Pennsylvania. Usually, in such environment only, it is quite abundant and frequently encountered. It appears adult early in July.

TRACHYRHACHIS KIOWA FUSCIFRONS (Stål). Probably local, not abundant and only at lower elevations in southwestern Pennsylvania. An eastern limit is Washington in this State (Fox and Osterman[4]). Prefers low grass in open areas of

[3] Recorded from Lehigh Gap, as *Trimerotropis citrina* by Rehn in 1902 and as *Spharagemon saxatile* by Fox in 1914.

[4] ENT. NEWS 48: 199, July, 1937.

poorer soil. Probably appears adult early in the Summer.

TRIMEROTROPIS CITRINA Scudder. This widespread southern species probably invades a very limited portion of the lowlands of southeastern Pennsylvania, a northeastern limit being Harrisburg, Pennsylvania. Prefers bare soil in waste fields, along roads, etc. Appears adult in July.

TRIMEROTROPIS MARITIMA MARITIMA Harris. Preferring the loose sand of upper sea beaches this insect invades the interior only short distances in local areas of similar character. It also works up bay shores and is known up the Delaware River as far as Washington Park, Delair and Burlington, New Jersey; Philadelphia Neck, Pennsylvania[5], and Chesapeake Bay at least as far as Chesapeake Beach, Maryland[5]. This latter material is usually atypic in coloration, more tinged with brown and having the caudal tibiae weakly to definitely pink. It appears adult early in July.

T. MARITIMA INTERIOR E. M. Walker. Occurs in areas of loose sand on the shores of the Great Lakes and in Pennsylvania is known only from Presque Isle, where it has been found abundant in August by E. S. Thomas. Probably appears adult in early July.

CIRCOTETTIX VERRUCULLATUS (Kirby). A northern insect found on bare rock outcrops and rock slides in the boreal portions of the mountains of northern Pennsylvania, southern limits being the Delaware Water Gap, Mount Carmel and Mahanoy City[6]. It appears adult in mid-July.

CYRTACANTHACRINAE.

Since *Schistocerca damnifica damnifica* (Saussure) occurs north in New Jersey to Manasquan, Medford and Westville (on the Delaware River), it should be found in southeastern Pennsylvania. Scudder has, however, alone recorded a specimen from this State without definite locality, taken many years ago by Schaum. It prefers dry open woodlands, appears adult

[5] Recorded as *citrina* by Rehn and Hebard in 1916, examination of this material enables me to correct these errors.

[6] At this locality found by H. Fox on nearly bare mine debris composed of rock fragments in a shallow valley between the ridges.

late in the Summer but is present adult until late the following Spring. It is occasional and rather sporadic in appearance.

SCHISTOCERCA AMERICANA AMERICANA (Drury). Possibly only a migrant in Pennsylvania. It becomes restless in the late fall, then frequently flying far north of its normal range. Such individuals are sometimes taken in or about Philadelphia and Harrisburg and have been captured as far north as Massachusetts. Generally distributed but prefers the dry open woodlands and high grass in fields. Its normal northern limit possibly runs across Maryland. Appears adult late in summer and is present to the south throughout the winter in this condition.

S. ALUTACEA (Harris). Though Tinicum Island is the only Pennsylvania record, the species may be present locally throughout the lowlands of Pennsylvania. It prefers rank herbage about bogs or near woods and also occurs in open woodland. It appears adult in July.

HESPEROTETTIX VIRIDIS BREVIPENNIS (Thomas). Sylmar, Chester County, VIII, 3, 1937, (H. R. Roberts; undergrowth in scrub pines). First Pennsylvania record. Probably very local. Occurs north to Wellesley, Massachusetts. Appears adult in early July.

MELANOPLUS GRACILIS (Bruner). This species occurs locally probably throughout all but the northern portions of western and central Pennsylvania. It has been recorded from Bloomsburg and I have specimens from Ligonier. It prefers grasses growing in damp places and bogs and appears adult early in July.

M. VIRIDIPES EURYCERCUS Hebard. This eastern race of a mid-western species is probably present locally throughout the mountains and western portions of Pennsylvania. I have studied material from Moosic Lake, Derrick City, Ligonier and Puketa Creek, the first three being southeastern limits of distribution. The insect occurs in colonies, sometimes in large numbers, in the richer undergrowth of open woodlands and appears adult in June.

As *Melanoplus similis* Morse is known both north and south of Pennsylvania it is certain to be found in the hills and mountains of the State. It is a very local inhabitant of richer

woodland undergrowth, but considerable colonies are sometimes found. It appears adult in early June.

As *Melanoplus hubbelli* Hebard, a species of similar habitat but more sluggish in action, is known north to the Cactoctin Mountains in western Maryland near the Pennsylvania line and from Ohio localities, it is certain to be found in the southern mountains of this State and also in the southwestern section. It appears adult in early June.

M. RUSTICUS OBOVATIPENNIS Blatchley. This is a northern and northeastern race of a south-central species. It occurs locally in colonies in the forest undergrowth of southwestern Pennsylvania at the lower elevations. I have material from Pittsburgh. It appears adult late in August.

M. DELAWARE Hebard. Scarce and very local on poor soil in open woodland undergrowth of hills in southeastern Pennsylvania, as yet recorded (as *tribulus*) only from Pink Hill in Delaware County, one of the serpentine outcrops of this region. A species occurring from the mountains of Georgia to those of southern New York and therefore present also at least in the eastern portions of the Pennsylvania mountains. Appears adult in June.

Another species of woodland undergrowth, *Melanoplus decoratus* Morse, should be sought though its distribution is undoubtedly much less extensive and does not reach as far north. It also appears adult in June.

M. SCUDDERI SCUDDERI (Uhler). Often abundant in weedy open areas[7] and occurs also in open woodlands throughout the lowlands of Pennsylvania and present, though there scarcer, in the mountain valleys. Appears adult early in August.

M. MANCUS (Smith). An abundant but local species of the woodland undergrowth of the Canadian Zone in the more eastern mountains of Pennsylvania, known west to Buffalo Gap near Harbleton and Buena Vista Springs. Appears adult in late June.

M. ISLANDICUS Blatchley. Similarly present in the mountains of southwestern Pennsylvania but as yet known from few

[7] Contrary to Fox, this is not a sylvan species though occurring often along woodland borders or under scattered trees.

localities, northeast to Mechanicsville in Clarion County and east to Chestnut Ridge in Westmoreland County. Appears adult probably in late June.

M. WALSHII Scudder. A more occasional but more widespread species of the forest undergrowth in the mountains of southwestern Pennsylvania in the Transition Zone. Known north only as far as Chestnut Ridge in Westmoreland County and northeast to Buffalo Flat in Union County. Appears adult in mid-July.

M. PUNCTULATUS PUNCTULATUS (Scudder). Probably present throughout Pennsylvania but exceedingly local. Arboreal and easily overlooked as it is a sluggish insect. Apparently prefers conifers and particularly pine trees. I have found many, but never without much search even after locating a colony, resting motionless in the sunshine on the trunks or lower branches of young pines. Appears adult late in August. Though colonies are often large, they are rarely found.

M. BIVITTATUS (Say). Common and generally distributed in the open throughout Pennsylvania. Prefers weed tangles, rich grasses and thick marsh vegetation. Appears adult in June.

M. DIFFERENTIALIS (Thomas). Appeared around Philadelphia about 1896, probably introduced from the West. Now abundant in waste weedy spots around the city and in marsh vegetation along the Delaware River in southeastern Pennsylvania. Appears adult in late July.

M. DAWSONI (Scudder). Rare and local as far as known and present only in the Canadian Zone of the mountains of northern Pennsylvania at Tobyhanna, a southeastern limit. Prefers boreal undergrowth of open forest areas. Appears adult in late June.

M. CONFUSUS Scudder. Probably present throughout Pennsylvania. Prefers sweet vernal and blue grass in open on gravelly or sandy drier areas. Appears adult in early June and has almost disappeared by mid-July. Often very local, rarely abundant.

M. FEMUR-RUBRUM FEMUR-RUBRUM (DeGeer). Generally distributed and very common throughout Pennsylvania. Pres-

ent in all grasses and weeds in the open. Appears adult in late June but not abundantly until late July.

M. BOREALIS JUNIUS (Dodge). Usually scarce and local in grasses of woodlands and bogs of the Canadian Zone in the mountains of northern Pennsylvania; material is before me from Moosic Lake. Prefers boreal grasses in damp open areas. Appears adult in mid-June.

M. FASCIATUS (F. Walker). Present and occasional in boreal woodland undergrowth, particularly low huckleberry bushes, throughout the Pennsylvania mountains, much more local and confined to the forested hills in the vicinity of Philadelphia. Appears adult in mid-June.

M. MEXICANUS MEXICANUS (Saussure). Present throughout Pennsylvania and sometimes very abundant in the open, particularly in weedy areas. Appears adult in early June but most abundant in summer, and a second brood reaches maturity early in August (Fox in litt.).

M. KEELERI LURIDUS (Dodge). Present throughout Pennsylvania, but probably local and not usually abundant. Prefers herbage along woodland borders or in open woods. Appears adult in July.

APPALACHIA HEBARDI Rehn and Rehn. Very local in sweet fern and other undergrowth of open forest or scrub in the mountains of Pennsylvania. Known north to Moosic Lake. Though it may be locally moderately numerous this is one of the rarer species. Appears adult in early July.

ZUBOVSKYA GLACIALIS VARIEGATA (Scudder). Local and confined to boreal forest undergrowth throughout the mountains of Pennsylvania. Thamnophilous and should be sought on hazel and alder bushes and on the lower branches and trunks of trees. A sluggish insect, difficult to locate, not frequently encountered and therefore not common in collections though sometimes present in large colonies. Appears adult in mid-July.

PAROXYA CLAVULIGER (Serville). Confined to the proximity of water in the lowlands of eastern Pennsylvania. Inhabits high marsh and swamp herbage. Appears adult in early July.

(To be continued.)

Biological Notes on Pseudolucanus placidus Say, Platycerus quercus Weber and Ceruchus piceus Weber (Lucanidae--Coleoptera).

By CLARENCE H. HOFFMANN, Morristown, New Jersey.

All of the rearings reported upon in this paper were completed in salve boxes supplied with relatively small particles of decaying wood which were moistened with a few drops of water about every other day. These boxes were kept in a basement room with a temperature of approximately 23°C.

I am grateful to E. A. Chapin for the identification of the Lucanidae, to D. G. Hall for the identification of *Theresia monohammi* Tns., and to D. J. Pletsch, A. C. Hodson, and Chi Liu for donating larval collections of *C. piceus*.

PSEUDOLUCANUS PLACIDUS Say.—Apparently very little has been written concerning this large species of Lucanid. Meek (1901), who treated statistically some variations in this species, concluded that variation was greater in the males than females and that there was no dimorphism in length of bodies, mandibles, or tibiae. Blatchley (1910) states that this beetle is common from May 1 to June 20 in Indiana, and that it is abundant in season along the beach of Lake Michigan. Girault (1913) collected a nearly grown grub under the surface of the ground at the base of a stump at Blacksburg, Virginia, on July 10, 1902. This grub was confined and formed the prepupa about August 1, pupated on August 3, and became an adult on October 6. The adult was not fed and died on October 21.

On June 3, 1933, the writer removed about 40 *P. placidus* grubs from a decayed oak log and the roots of two oak stumps. Most of the grubs were in the subterranean roots of the old stumps, which, at this time, were very dry and hard. The majority of these grubs appeared to be practically full-grown and 7 of the 16 isolated in salve boxes completed their metamorphosis within 3 months after collection. Four grubs, on the other hand, lived in captivity for over three years, dying before pupation. Pupation of the other grubs occurred about the middle of August and adults issued up to the middle of Sep-

tember. The larvae became less active about six days prior to prepupation. The mean length of the prepupal stage for 10 individuals was 5.5 days, range 4 to 7 days; while the mean length of the pupal period for 7 individuals was 29.6 days, range 29 to 30 days. Longevity records kept for 6 individuals show that they lived 156, 260, 297, 299, 336, and 489 days respectively. One pair of reared beetles isolated on September 23, 1933 were observed mating on May 10, 1934. Although the female lived 489 days, she did not deposit any eggs on or near the provided wood.

PLATYCERUS QUERCUS Weber.—According to Riley (1870), Mr. E. J. Ayres of Villa Ridge, Illinois, observed these beetles injuring many young pear trees by completely eating out the ends of the new shoots and of the buds just before they burst. This author also mentions that the larvae feed in dead oak logs and stumps, and intimates that the species overwinters as an adult. Blatchley (1910) records that *P. quercus* occurs in Indiana from March 25 to October 29, adult emergence occurring the latter part of March and mating about May 1.

On March 23, 1933, I took a larva of this species in the firm part of a fallen decayed hickory branch near Baldwin, Kansas. After isolation, the larva formed a cell within a small piece of this wood and did not begin to feed until May 28. Another larva collected in an old log at the same place began feeding on May 3. Pupation of the former occurred on August 28, and the adult emerged on September 8. On May 6, 1933, I collected 3 grubs of this species from an old log, possibly elm, near Taylors Falls, Minnesota. They were not feeding at the time of collection. One of the larvae survived laboratory conditions, pupated on August 3, and the adult emerged on August 16. The two reared adults were kept alive until October 1 at which time they were killed and pinned.

CERUCHUS PICEUS Weber.—Felt (1906) states that the larvae of this species have been recorded from old beech stumps, decaying chestnut, willow, and birch. He records taking it abundantly in rotting black cherry. In Indiana, *C. piceus* occurs in and about decaying beech, oak, and other logs from April 10 to October 25 (Blatchley, 1910).

This species was most difficult to rear in salve boxes, and, although I had an abundance of material, only one larva was reared to maturity. On April 8, 1933, A. C. Hodson collected about 80 grubs from a small section of a decayed elm log, which was partially submerged, near Victoria, Carver County, Minnesota. Both small and large larvae were represented in this collection, the smaller ones being about 7 mm. long. D. J. Pletsch collected 4 large larvae from an old Norway pine log at Itasca Park, Minnesota on May 29, 1933. One of these became a prepupa on July 23, pupated July 26, and emerged as an adult on August 11. Chi Liu removed 33 grubs and one adult from an old log in Anoka County, Minnesota on April 14, 1934. On May 29 of the same year, I collected both larvae and adults from a decayed birch stump at Itasca State Park, Minnesota.

THERESIA MONOHAMMI Tns. PARASITIC ON CERUCHUS PICEUS.—A number of the large *C. piceus* grubs collected by Dr. Hodson on April 8, 1933, were parasitized by *T. monohammi*. As this dipterous larva approached maturity, the beetle larva became less active than usual, certain portions of the cuticula turned deep blue or black, and some of the abdominal segments became swollen. The parasitic larvae, which when mature were approximately 12 mm. long and 4 mm. wide, left their hosts during the latter part of April and all pupated within two days afterward. It was observed that only one *T. monohammi* larva completed its development within each grub of *C. piceus*. The dark brown puparia formed in the wood debris were about 12 mm. long and 4 mm. wide. Of the 6 individuals reared to maturity, 4 required 14 days in this stage while the other 2 required 15 days. Adult emergence occurred between May 5 and May 11, 1933.

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The Occurrence of Two European Nitidulid Beetles in Wisconsin.

During two seasons of collecting at Madison, Wisconsin, the following European Nitidulidae were taken by the author:

BRACHYPTEROLUS PULICARIUS (L.). This insect has been reported from various New England localities. Hatch[1] gives a bibliography of the American literature. The following Wisconsin localities may be added: Madison, June 4, 1934, 3 specimens of flowers of *Smilacina racemosa*, June 15-27, 1935, 3 specimens; Devil's Lake State Park, May 25, 1935, 6 specimens sweeping, 2 on flowers of *Prunus virginiana;* Cloverleaf Lakes, Shawano County, June 15, 1935, 1 specimen.

NITIDULA CARNARIA (Schall.). Abh. Schrift. Nat. Ges. Halle I, 1783, p. 257. This species resembles a small *N. rufipes*, but with disc of elytra marked with two pairs of yellow spots, the anterior pair at basal third, widely separated, slightly elongate longitudinally; posterior pair at apical third, more approximate, rather transverse, larger. In some specimens there is a humeral pale area nearly contiguous to the anterior spot. The elytral maculation distinguishes this species at once from the other *Nitidula* of our fauna. The specimens before me are 2.4-3 mm. long.

At Madison two specimens of this necrophile were taken at carrion, May 28 and 30, 1934, and the following spring a score of specimens were taken at similar habitats April 29 to June. Six specimens have also been received from J. E. Blum, taken at Oakland, California, April, 1934. This is indicative of a wide distribution and possible long establishment of this species in our fauna.

H. R. DODGE, University of Minnesota.

[1] Hatch, M. H., 1928. Jour. New York Ent. Soc., 36: 35-36.

A New Species of Phyllophaga (Coleoptera, Scarabaeidae) from Kentucky.*

By Paul O. Ritcher, Kentucky Agricultural Experiment Station, Lexington, Kentucky.

The total number of species of *Phyllophaga* taken in Kentucky has been increased to twenty-five as a result of collections made by the writer the past two years. The list is composed of *Phyllophaga anxia* (Lec.), *arkansana* (Schffr.), *bipartita* (Horn), *crenulata* (Froehl.), *delata* (Horn), *ephilida* (Say), *fervida* (Fab.), *fraterna* (Harris), *fusca* (Froehl.), *futilis* (LeConte), *glaberrima* (Blanch.), *hirticula* (Knoch), *hirtiventris* (Horn), *hornii* (Sm.), *ilicis* (Knoch), *implicita* (Horn), *micans* (Knoch), *praetermissa* (Horn), *profunda* (Blanch.), *prunina* (Lec.), *quercus* (Knoch), *rugosa* (Melsh.), *tristis* (Fab.), *vehemens* (Horn) and one species which appears to be undescribed. The new species is named after the state in which it occurs.

Phyllophaga kentuckiana, n. sp.

This species belongs in Horn's Group IX. It resembles *P. fraterna* and *P. forsteri* in many respects but is apparently quite distinct.

Length 16-20 mm. General form oblong, slightly dilated posteriorly. Medium to dark brown in color with slightly darker head and pronotum. Surface moderately shining.

Clypeus rather deeply emarginate; margin reflexed; surface coarsely, closely punctate. Head closely punctate, the punctation slightly coarser than that of clypeus.

Pronotum widest at base; sides subangulate at middle, anteriorly straight and convergent; posteriorly vaguely subsinuate; side margins feebly crenate; surface moderately shining, coarsely, sparsely punctate; punctures rather unevenly distributed. Each pronotal puncture bears a short recumbent yellow hair; hairs in some specimens longer and more prominent at sides.

Elytra: Sutural costae moderately strong, rather wide, sparsely rugose-punctate; discal costae somewhat vague; submarginal costae narrow, obsolete on basal half. Elytral surface shining; finely, irregularly, not closely punctate.

Surface of mesosterum finely, closely punctate; a rather sparse vestiture of yellowish hair.

* The investigation reported in this paper is in connection with a project of the Kentucky Agricultural Experiment Station and is published by permission of the Director.

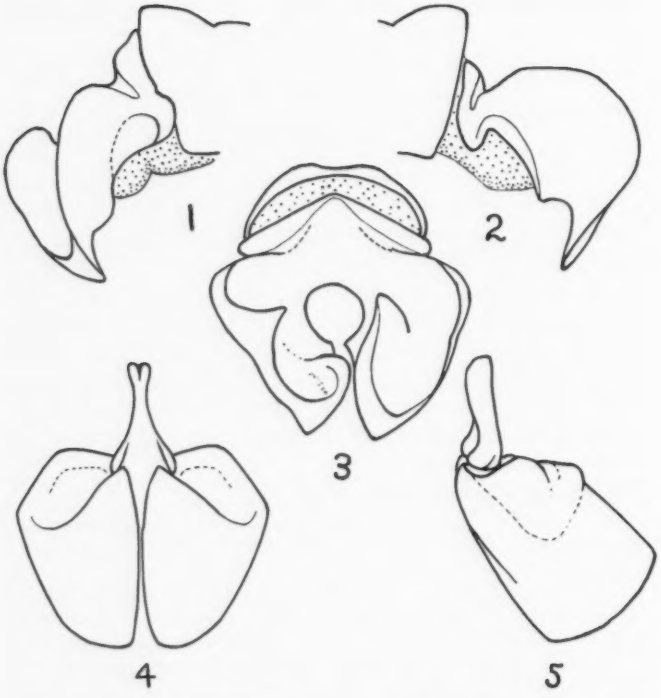

Fig. 1—Upper left—Left male clasper. Fig. 2—Upper right—Right male clasper. Fig. 3—Center—Hind view of the male claspers. Fig. 4—Lower left—Ventral view of female genitalia. Fig. 5—Lower right—Side view of female genitalia.

Abdomen with surface finely, rather sparsely punctate, with short, fine, yellowish hairs. Pygidium rather broad, convex. Surface rather finely and sparsely punctate.

Tooth of claw median; long, nearly right angled in both sexes.

♂: Antenna 10-segmented; club slightly longer than stem. Upper spur of hind tibia lanceolate elliptical, slightly decurved, obtuse. Lower spur fixed, two-thirds length of upper, acute. Abdomen with longitudinal flattened or depressed area; penultimate segment with an extensive, finely roughened slightly

elevated, arcuate ridge more pronounced to sides; terminal segment with a median, slightly roughened depression. Genitalia well developed, superficially resembles those of *P. rugosa;* quite distinct from those of *P. fraterna* and *P. forsteri.* May be distinguished from *P. fraterna* in that posterior angle of right male clasper is acute and curved inward with tendency to form a ridge on inner face of right clasper. No deep notch in right clasper as in *P. forsteri.*

♀: Antenna 10-segmented; antennal club slightly shorter than funiculus. Upper spur of hind tibia as in male; lower, three-fourths length of upper, broad, obtuse. Public process intermediate between that of *P. fraterna* and *P. forsteri;* larger and thicker than pubic process of *P. forsteri,* with notch at distal end.

Holotype.—Male; Lexington, KENTUCKY, May 26, 1936, feeding on red oak.

Allotype.—Female; Lexington, Kentucky, May 11, 1936, feeding on bur oak.

Paratypes.—8 males and 10 females. Two males and four females, Lexington, Kentucky, May 21, 1936. Two males and four females, Cynthiana, Kentucky, June 2, 1920. Three males and two females, Winchester, Kentucky, May 24, 1905. One male, near Mammoth Cave, July 23, 1894.

Holotype and allotype deposited in National Museum. Paratypes in writer's collection and collection of Kentucky Agricultural Experiment Station.

Food plants.—Taken on bur, red and pin oak, walnut, and elderberry.

Some Field Equipment.

By H. ELLIOTT MCCLURE, Ames, Iowa.

Several years ago I had a bee in my bonnet to go to the tropics and collect insects. For months I planned and studied what I thought I would need for such an expedition. Either I did not know where to look or the literature on specific equipment for field work is scattered and not usually catalogued. I had considerable difficulty finding helpful hints and even finding men who could tell me what to and what not to take. The tropical trip faded, but I continued to build up

equipment which I thought would sustain investigation in a locality away from drugstores and museums.

During May 1936, on the spur of the moment, I decided to go to Churchill, Manitoba and collect tundra forms. In three days I was packed and on the road with Mr. A. C. Twomey, ornithologist. My equipment worked so well that I feel I should pass on at least a list of it to anyone else considering a similar trip.

In this instance we were to travel by automobile and by rail so that weight was not a prime factor. Further, we were to live in a bunk car or cabin and would not have to prepare to live in a tent. When fully packed I had two hand or suitcase trunks, two wooden boxes 20" x 20" x 10", two small wooden boxes, one large canvass bag, and one rollup of blankets. The weight was approximately 300 pounds, and the equipment had to last at least eight weeks.

One trunk was for clothes, while the other I called my collecting trunk. Into it I had built shelves and drawers to hold all of the minute and varied collecting and preserving accoutrements of an entomologist. This material included five gross of vials, four of which were filled with alcohol before being packed. Ethyl acetate and cellophane were taken along and many killing bottles were made out of dry vials, so that individual insects from different plants, etc., could be killed and carried with the least amount of space. Larger killing bottles were made with calcium cyanide. An extra gallon of alcohol was included and my guess was so close that I had only ½ pint left over when I packed to return. During the last week I lacked sufficient insect pins. I did not take along a triangle punch and needed one. Of the following list every thing was used, but the set for inflating larvae:

5 gross 2 dram short vials
1000 insect pins, sizes 00-7 (needed more)
1000 common pins
1 gallon alcohol
1 lb. ethyl acetate
½ lb. cellophane
Several scissors
Several dissecting needles
Millimeter rule
2 crow quill pens
2 fine camel hair brushes
4 Schmidt boxes (needed more)

½ lb. calcium cyanide
Pinning block
5000 labels
Reading glass
Pocket lens
Larva inflation set (not used)
Several tweezers
Several scalpels
Sheet cork
5 wide mouth bottles
Triangle punch (not taken but needed)
½ lb. white arsenic
Several slides
Balsam
Xylol

For actual collecting I had one collapsible sweep net with two canvas sweeping bags and one butterfly net. The ability to change nets quickly was a great help, for I would sweep in one minute and chase butterflies the next. For aquatic insects I used a long handled acquatic net, with a spare bag for it also. All of these bags I had previously dyed a leaf green, as that is apparently the least obnoxious color to most insects. For insects of the soil surface and debris I used my soil surface sampler described in *Ecology,* October, 1935. Altho I claimed too much accuracy for this apparatus in this article, it does serve the purpose of giving fairly accurate collections of soil surface fauna rapidly and I am continuing to use it. Three collapsible light traps lighted by coal miner's carbide lamps were used, but these failed to function in the North, because it was hardly dark during June and July and in the early morning hours the temperature was too low for insect flight. They had worked excellently in Illinois. Also three screen bait traps were included, but these too were not successful, apparently because the high north wind dispersed the odor of the attractant too rapidly. Only in protected spots in the black spruce-tamarack forest did these work at all. For the lights I took 10 pounds of carbide and for the bait traps three cheap perfumes, molasses and honey. The soil surface samples were collected in six cloth bags and then taken to the bunk car for study. Insects from the sweepings were put into one pint jars in the field and later separated from the leaves, etc. Twenty-four pint mason jars were taken.

Every worker has his own methods of keeping records, but for uniformity and space I use the hundred page ledgers available in most ten cent stores. Sheets of typing paper were

folded and cut into eight pieces each and records were written on these in the field and placed in each pint jar with each collection. Later the records were copied into ledgers under proper headings. I took eight of these. Several small pocket note books were included, but not used. I took along three eversharp pencils with plenty of extra leads. Much fishing failed to rescue one pencil from the bottom of a crystal clear lake. For reference Comstock's *An Introduction to Entomology* and a collection of keys for larvae were used and, altho Ward and Whipple's *Fresh Water Biology* was not included, it was needed.

For records of weather conditions several thermometers were used and broken. I borrowed and insured a hygrograph thermograph, and sling psychrometer, so that accurate and continuous records of the temperature and humidity in one location were obtained. Additional paper, ink, and points were carried for these. I should like to have had an atometer and rain gauge also, but these were not readily available when I left.

Additional odds and ends that were found to be useful were:

1 lb. Plaster Paris
1 ream typing paper
1 bottle blue black writing ink
1 bottle red writing ink
1 bottle India ink
Several pipettes
Several candles
1 metal tape measure
Animal cage
Numerous thumb tacks, clasps, etc.
1 package cotton
2 tubes glue
Water tight match case
Several gummed labels, address, etc.
1 sq. ft. copper screen
1 sq. ft. sand paper
1 pack index cards
Many rubber bands
1 pack fine cardboard (for triangles)
1 ball cord
Hammer
1 pair pliers
6 small tin cans
2 small funnels
Hand axe
Hunting knife
Pocket knife
Compass
Field glasses
Several metal pill boxes
1 roll wire
Folding drinking cup
Several screen top lids for jars
Gasoline lantern
Flashlight and 12 extra batteries

The animal cage was made by soldering copper screen into the top of a bread box and proved to be very handy. Mine housed snakes, frogs, birds, and lemmings during the trip.

My photographic equipment was cheap, but effective. The camera was an Eastman Kodak taking 116 film or 2½" x 4¼" pictures. With it I carried a K³ color filter, a portrait lens reducing the focal distance to 18 inches, and another portrait lens reducing the focal distance to 7 inches. The last an optometrist ground for me. I also had with me two tripods, the lighter of which I carried at all times. I used 30 packs of verichrome negatives and altho I did not attempt any developing and printing I did have a little developing fluid and fixative with me. Mr. Twomey carried a photometer which was indispensable to us. All of this equipment except the tripods fits into a metal watertight container which I keep on hand in case that I might be canoeing or in some other situation where the negatives and camera might become wet.

Naturally anyone going out into the open will carry a first aid kit, and this too is something that varies with the user's needs. I have a small scout kit which I carry in my collecting box at all times. It is fortified with other medicines left at camp. Besides the kit, mine usually includes bicarbonate of soda, extra gauze and tape, extra bandaids, iodine, mercurochrome, cold reliefs, vaseline, laxative, etc.

As food was available in Churchill, we did little or no cooking, but boarded out. Nevertheless, for tea, washing, etc., a gasoline stove and an ordinary camp cooking set was much used. This would have to be augmented for anyone leaving civilization entirely.

Now to the much worried about and never understood problem of clothes. What you will need varies with each locality and wherever possible you should contact someone in that locality, or who has been there, to find just what you want. Fortunately Mr. Twomey having had previous experience with the North could direct me. Altho there were three or four decidedly warm days at Churchill, the weather was not dependable and we had to go out prepared for rapid drops in temperature if the wind shifted from south to north. Natur-

ally, being from the South we were more susceptible to these changes and the way I bundled got many a laugh out of the natives. If you are susceptible to mosquitoes and black flies, then it is necessary that you have clothes of close and heavy enough weave to resist their attacks. Mosquitoes will work at the seams of a pair of breeches with a diligence and fixity of purpose that is highly commendable. They even bit me on the toughened palms of my hands. Mosquito netting and a mosquito bar are essential. The netting should be black, for after wearing a head net for days the eyes are strained by any other color. I took a yard of black veiling and sewed it together into a cone. Inside of this I sewed the wire rib of a nail keg. In wearing this, I pulled the whole over my felt hat and tucked the bottom ends inside of my jacket, so that the wire ring rested on my shoulders. The brim of the hat and the ring thus held the netting away from the back of my neck and my long nose. The nature of the country makes expensive, high grade boots a necessity and I was told that, if I spent less than $25.00 for a pair I would come back barefooted. I wore out two pairs of leather boots and one pair of rubber hip boots in eight weeks. The tundra is made up of areas of rocks and gravel interspersed between soggy water soaked muskeg and pools of water. I waterproofed the leather about every two days but constant walking in the water and out onto rocks softened and rapidly wore thru the soles. I should suggest that an expensive pair of rubber boots, either knee or hip length, with a laced and fitting shoe, would be the most satisfactory foot wear for the tundra.

The clothes that I took and actually needed are listed below; everything else was wasted weight and space:

2 pair whipcord breeches
2 wool underwear
3 pair wool socks
2 wool shirts
1 leather sheepskin coat (or canvas parka)
1 suede jacket
1 pair shorts and shirt
2 cotton work shirts
Mosquito bar (necessity)
Mosquito repellent
Hat
Gloves (preferably leather)
12 handkerchiefs
12 towels
6 wash cloths
4 wool blankets

2 pair leather boots
Neats foot oil
Waterproofing material
1 pair rubber hip boots
Black mosquito netting (necessity)
1 cotton blanket
1 small mattress (or sleeping bag)
Soap, shaving kit, toothpaste, Needles, thread, thimble, buttons
2 flannel pajamas

I carried no gun, and altho I worked several miles from the town and polar bears were in the vicinity, I saw no animals more dangerous than a Hudsonian red squirrel or seal. Mr. Twomey carried only a light shot gun for birds and a year or so before he had encountered a female polar bear with a cub, but escaped by backing away slowly after she had calmly stood on her hind legs and observed him.

The equipment as I have listed here served me well during my eight weeks at Churchill and I was not handicapped by lack of anything, but plankton nets. As it was, I collected nearly 50,000 specimens of all or nearly all of the orders of insects represented in the region and of many of the other arthropod groups.

Reduced Rates and Tours to Europe
On account of the Seventh International Entomological Congress at Berlin, August 15 to 20, 1938.

Special reduced steamship rates will be in effect for those booking under the committee's arrangements.

The following tour will be organized, if enough book, for those wishing to tour Europe before or after the Congress or both. For announcement of the Congress see ENTOMOLOGICAL NEWS, October, 1937, page 242.

Sailing June 25, six day motorcoach tour through Ireland, one week motorcoach tour through England, nine days in London and northeastern England (Scotland optional) Norwegian fjords and glaciers, Oslo three to five days, Copenhagen, North Central Germany. After the Congress: Breslau, Krakau, Budapest, Vienna, the Danube, four days at an Austrian Alpine Lake, Munich, Switzerland (Rigi, Lake Lucerne, Pilatus, Jungfrau), Paris. Sailing from Cherbourg September 18.

If you or your friends have any interest in the tour, send in your name and you will be kept informed. No general announcement will be mailed to the membership list.

Joint Committee of Entomological Society of America and American Association of Economic Entomologists.
A. R. SHADLE, University of Buffalo, Chairman.
R. W. LEIBY, Cornell University.

The Type Species of the Genus Lampides Hübner, (Lepidoptera: Lycaenidae).

By Leigh E. Chadwick, Harvard University,
Cambridge, Massachusetts.

In 1873, A. R. Grote (see tabulation below) published a supposed new genus and species of Theclinae. This name, *Callicista ocellifera* Grote, now rests in the synonymy of *Strymon columella* Fabr., and is of no particular interest here. However, Grote followed his formal descriptions with a few remarks in which he compared his species with some other members of the family, and concluded his article with the statement that "the European L. Boeticus may be considered the type of Lampides."

This statement is of some consequence, since, so far as it has been possible to determine, it constitutes the first valid fixation of the type of the Hübnerian genus, and has been overlooked by subsequent writers. Modern students have followed Scudder's selection of *L. zethus* Hbn. (= *Papilio celeno* Cram.) as the type of this genus. This course has involved the erection of a new name, *Cosmolyce* Toxopeus, for *boeticus* Linn., and the placing, by some students, of *Jamides* Hbn., type *Papilio bochus* Stoll, as a synonym of *Lampides* Hbn. For convenience, the bibliographical facts may be summarized as follows:

Lampides Hübner

Hübner, [1819] Verz. bekannt. Schmett. (5): 70

Id., 1823, Zuträge z. Exot. Schmett. 2: 11

Grote, 1873, Bull. Buffalo Soc. Nat. Sci. 1: 179 specifies *L. boeticus* Linn., 1767, as type

Scudder, 1875, Proc. Amer. Acad. Arts Sci. Boston 10: 199 regards *boeticus* Linn. as the type of *Polyommatus* Latreille, and therefore specifies as the type of *Lampides* Hbn. *L. zethus* Hbn. (= *Papilio celeno Cram.*) under the name *aelianus* Fabr.

Kirby, 1896, *in* Allen's Nat. Libr. Handbook Lepid. 1 Butt. 2:82 independently selects *L. boeticus* Linn. as the type of *Lampides* Hbn.

Toxopeus, 1927, Tijdschr. Ent. 70: 268 *nota* proposes the new name *Cosmolyce* for the reception of *L. boetica* Linn., Tox. (= *L. boeticus* Linn.)

Hemming, 1933, Entomologist 66: 224 recognizes Scudder's designation of the type of *Lampides* and accepts *Cosmolyce* Toxopeus, at the same time inadvertently offering the new name *Lampidella* for the same purpose

id. , ibid. p. 276
sinks *Lampidella* Hemming as a synonym of *Cosmolyce* Toxopeus

id. , 1937, Hübner, Vol. II: 215 cf. for dating of Hübner references cited

It has been realized for some time that the type of *Polyommatus* Latreille is not *boeticus* Linn., as Scudder thought, but *Polyommatus argus* Fabr., Latr. *nec* Fabr. 1804 (= *Papilio icarus Rott.*, 1775). Cf. Hemming, 1934, Gener. Names Hol. Butt. 1: 109 no. 277. Furthermore, *boeticus* Linn. is the fifth of the eight species and one MS name listed under *Lampides* in the *Verzeichniss*, and also the species of that genus chosen by Hübner for comparison with *L. balliston* in the *Zuträge*. Consequently, nothing stands in the way of accepting Grote's designation of *boeticus* Linn. as the type of *Lampides* Hbn. *Cosmolyce* Toxopeus must therefor fall as a synomyn of *Lampides* Hbn.

This leaves two possible courses in respect to *celeno* Cram. and its congeners. *Jamides* Hbn., [1819], type *Papilio bochus* Stoll, 1782, is available for use by those who regard *celeno* Cram. and *bochus* Stoll as congeneric; in any case it must be separated from *Lampides* Hbn. Students who feel that *bochus* Stoll is generically distinct from *celeno* Cram. and its allies will be under the necessity of erecting a new genus to receive these species.

Rare Butterfles Captured by Dr. Avinoff (Lepid.).

The mysterious female of the rarest species of butterfly (*Closyne pantoni*) known to the island of Jamaica, a butterfly never before netted by a scientist, has been captured by Dr. Andrey Avinoff, director of Carnegie Museum, Pittsburgh, Pennsylvania, in the strange rocky section of Jamaica known as the Cockpit Country. Dr. Avinoff has 18 of the rare butterflies, including three females, and 10 specimens of *Papilio homerus*, the largest swallowtail butterfly in the western hemisphere. ANNA JANE PHILLIPS in the *Pittsburgh Post-Gazette*, July 21, 1937.

Entomological Literature

COMPILED BY V. S. L. PATE, LAURA S. MACKEY and E. T. CRESSON, Jr.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the list of Periodicals and Serials published in our January and June issues. This list may be secured from the publisher of ENTOMOLOGICAL NEWS for 10c. The number of, or annual volume, and in some cases the part, heft, &c. the latter within ( ) follows; then the pagination follows the colon :

All continued papers, with few exceptions, are recorded only at their first installments.

(*) Papers containing new forms or names not so stated in titles, have an * within parentheses thus (*) following the pagination of reference to paper.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

Note. Titles of papers containing new forms or new names will be indicated by an asterisk within parentheses at end of reference, (*).

Papers published in the Entomological News are not listed.

GENERAL.—Abbott, C. E.—Photographing insects. [19] 32: 155. **Carpenter, F. M.**, et al.—Insects and arachnids from Canadian amber. Collembola by Folsom; Homoptera by Essig; Hymenoptera by Kinsey and Brues; Diptera by Boesel; Arachnida by Ewing. [Univ. Toronto Studies] No. 40: 7-62, ill. **Carpenter & Collins.**—Notes on insects collected in N. W. Greenland by the Oxford Univ. Land Exped. of 1934-35, with description of a n. sp. of Rhamphomyia (Dipt.). [75] 20: 401-409, ill. (*). **Goldschmidt, R.**—Cynips & Lymantria. [90] 71: 508-514. **Imms, A. D.**—Some reflections on recent developments in entomology. [107] C: 1: 57-66. **Schneider, H.**—Insektenplagen II. [17] 54: 525-528. **Secastopulo, D. G.**—Methylated spirit as a relaxing agent. [21] 49: 113. A preservative fluid for metallic pupae. [21] 49: 113-114. **Sparrow, F. K.**—Some Chytridiaceous inhabitants of submerged insect exuviae. [Proc. Amer. Phil. Soc.] 78: 23-61, ill. **Wehrli, E.**—Uber alte und neue genera, subgenera, species and subspecies. [17] 54: 502-503, cont. **Williams, C. B.**—The use of logarithms in the interpretation of certain entomological problems. [35] 24: 404-414.

ANATOMY, PHYSIOLOGY, ETC.—Alpatov, W.—On some quantitative regularities in the growth of the silk gland in Antherea pernyi. [Zoologitsheskij Jour.] 16: 574-578. (in Russian with English summary). **Anon.**—Observations on the larval antennae of the crickets. [Ent. &

Pathol., Hangchow] 5: 457-458. **Barth, R.**—Bau und funktion der Flügeldrüsen einiger Mikrolepidopteren. [94] 150: 1-37, ill. **Bodenstein, D.**—Beintransplantationen an Lepidopterenraupen IV. Zur Analyse experimentell erzeugter Bein-Mehrfachbildungen. [87] 136: 745-785, ill. **Boyd, W. C.**—Cross-reactivity of various hemocyanins with special reference to the blood proteins of the black widow spider. [92] 73: 181-183. **Brocher, F.**—Un physiologiste des insectes. By. A. Pictet. [41] 16: 749-757, ill. **Brown, A. W. A.**—A note on the utilisation of Polysaccharides by a grasshopper. [22] 28: 333-336. **Carpentier, F.**—Sur le tube digestif des Tridasctyloides. [33] 77: 283-291, ill. **Crew & Auerbach.**—"Spheroidal": A mutant in Drosophila funebris affecting egg, size and shape, and fecundity. [Pro. Roy. Soc. Edinburgh] 57: 255-268, ill. **Edney, E. B.**—A study of spontaneous locomotor activity in Locusta migratoria migratorioides by the actograph method. [22] 28: 243-278, ill. **Epure, E.**—Observations sur le corps gras des larves de Simulium. [Arch. Zool. Exp. & Gen.] 79: 17-23, ill. **Fiedler, H.**—Die wichtigsten schadlichen Erdraupen der Gattung Agrotis (Lep., Noct.). Ein Beitrag zur Biologie, Morphologie und praktischen systematischen Erkennbarkeit der Larven und Imagines von Agrotis segetum, A. exclamationis, A. vestigialis und A. tritici. [11] 1936: 113-178, ill. **Gabler, H.**—Beitrag zur kenntnis des eies, der eiblage und des larven von Calcoris biclavatus. [34] 119: 299-302, ill. **Heuser, R.**—Die ursache der verschiedenen puppenfarben bei Papilio machaon. [Mitt. Munchner Ent. Ges.] 27: 52-56. **Hilton, W. A.**—Nervous system & sense organs. XLIV. Thysanoptera. [13] 29: 71. **Ilse, D.**—New observations on responses to colours in egg-laying butterflies. [31] 140: 544-545, ill. **Ishmaer, A.**—The morphology and postembryonic growth of the silk-secreting gland of Antherea pernyi, (in Russian with English summary). [Zoologitsheskij Jour.] 16: 239-246. **Jackson, D. J.**—Host-selection in Pimpla examinator. [107] (A) 12: 81-91, ill. **James, H. C.**—Sex ratios and the status of the male in Pseudococcinae (Cocc.). [22] 28: 429-461. **Kassianoff, L.** Etude morphologique et biologique de la famille des Cimicides. [54] 15: 385-408, ill. **Knipling & Rainwater.**—Species and incidence of dipterous larvae concerned in wound myiasis [Jour. Parasit.] 23: 451-455. **Lawrence, R. F.**—A stridulating organ in harvest-spiders. [75] 20: 364-369, ill. **Lesperon, L.**—Recherches cytologiques et experimentales sur la secretion de la soie et sur certains mecanismes excre-

teurs chez les insectes. [Arch. Zool. Exp. & Gen.] 79: 1-159, ill. **Lison, L.**—Etudes histophysiologiques sur le tube de Malphigi des insectes. II. Phenomenes d'arthryocytose dans le tube de Malphigi chez les Orthopteres. [Arch. Biol., Paris] 48: 489-512, ill. **Maloeuf, N. S. R.**—The biology of light production among the arthropods. [Science Progress] 32: 228-245. **Mariani, M.**—Anatomia e fisiologia degli organi genitali femminili delle Pieris (Pierid) [Festsch. Dr. E. Strand] 3: 434-450, ill. **Mukerji & Bhuya.**—Reproductive system of the Bruchid beetles, B. 4-maculatus and B (Callobruchus) sinensis. [J. Morph.] 61: 175-221 ill. **Payne, N. M.**—The differential effect of environmental factors upon Microbracon hebetor (Hym., Braconidae) and its host Ephestia kuhniella (Lep., Pyralid.). III. Effect of the sting of the parasite and of two chemical agents on the respiratory rate and quotient of the host larvae. [92] 73: 147-154. **Pradhan, S.**—The alimentary canal of Epilachna indica (Coccinell.) with a discussion on the activity of the mid-gut epithelium. [Jour. Roy. Asiatic Soc. Bengal Sci.] 2: 127-156, ill. **Querci, O.**—Records about the development of a few Papilio. Influence of reflected radiation. [21] 49: 109-110; 111-112. **Rao, T. R.**—A comparative study of the chromosomes of eight genera of Indian Pyrgomorphinae. [J. Morph.] 61: 223-255, ill. **Rivnay, E.**—Moisture as the factor affecting wing development in the citrus aphis, Toxoptera aurantii. [22] 28: 173-179. **Salt, G.**—The egg parasite of Sialis lutaria, a study of the influence of the host upon a dimorphic parasite (Trichogrammat.). [116] 29: 539-553, ill. **Sick, H.**—Die Tympanalorgane der Uraniden and Epiplemiden. [89] Abt. Anat., 63: 351-397, ill. **Silvestri, F.**—Insect polyembryony and its general biological aspects. [Bull. M. C. Z., Harvard] 81: 469-498, ill. **Thorpe & Jones.**—Olfactory conditioning in a parasitic insect in its relation to the problem of host selection. [Proc. R. Soc.] B, 124: 56-81. **Wickwire, H. A.**—Mendelian 3-1 ratio of striped larvae and a modifying factor (Saturni.). [4] 69: 137-139, ill. **Winberg & Shcherbakov.**—The metabolic rate and duration of life in three species of Drosophila. [Zoologitsheskij Jour] 16: 311-323. (in Russian with English summary). **Zariquiey Alvarez, R.**—Contribution a l'etude de la femelle de Phlebotomus ariasi. [54] 15: 409-418, ill.

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